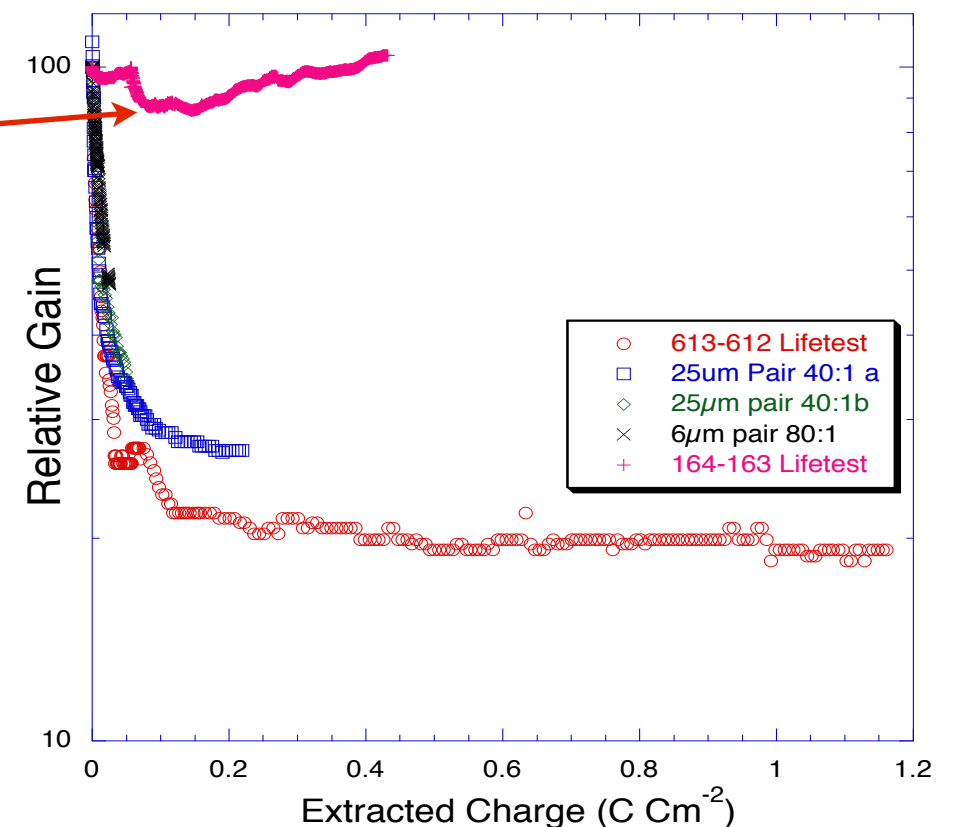


Status, Requirements, and Plans for Baking & Scrubbing

Bob Wagner and Dean Walters
LAPPD Single Tile Facility Review
Friday 16 March 2012

Status for Baking & Scrubbing

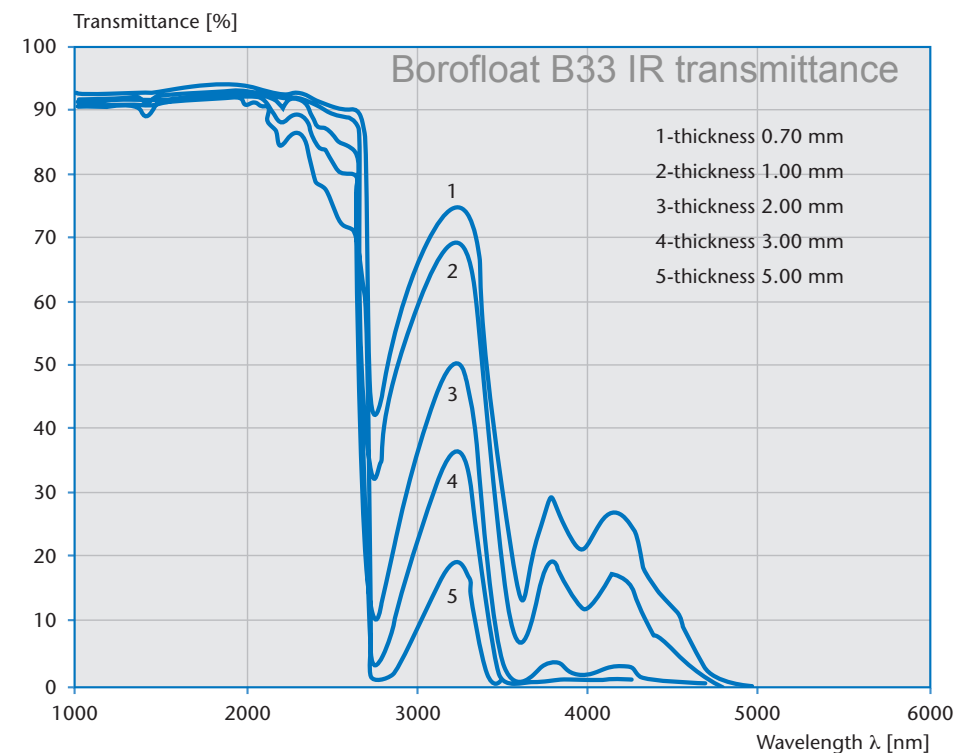
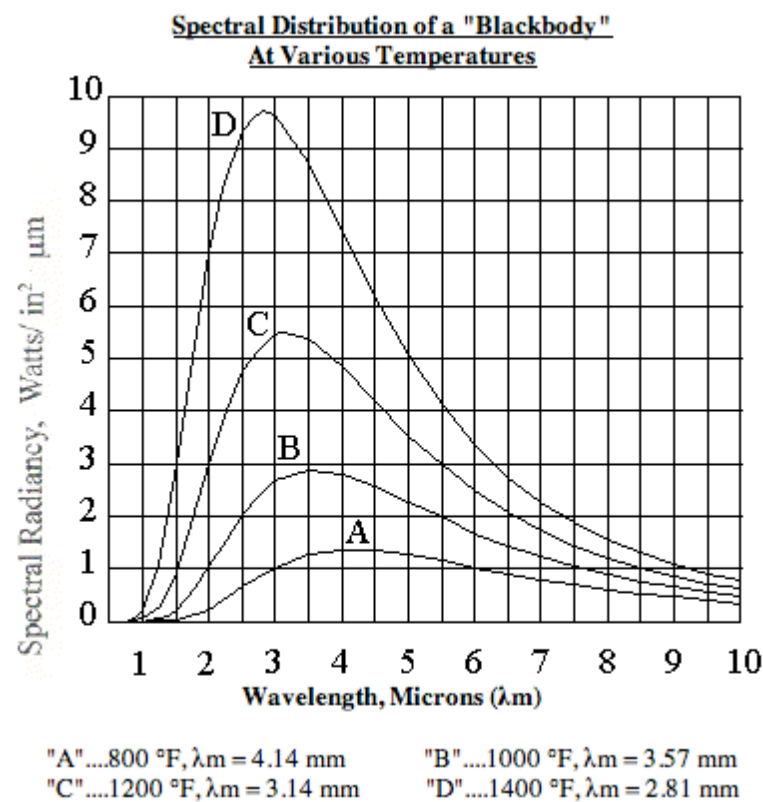
- ▶ No development or testing in progress at Argonne presently for baking or scrubbing
- ▶ Scrubbing:
 - Pre-conditioning test at SSL looks promising for minimal scrubbing
 - Performed on 33mm MCP pair 20 μ m pore with electrode over ALD
 - Bake at 350 $^{\circ}$ C before scrub
 - Scrub current incremented 1 μ A \rightarrow 2 μ A \rightarrow 3 μ A
 - No drop in relative gain throughout



Scrub @ 3×10^5 gain, 700v per MCP

Requirements for Baking

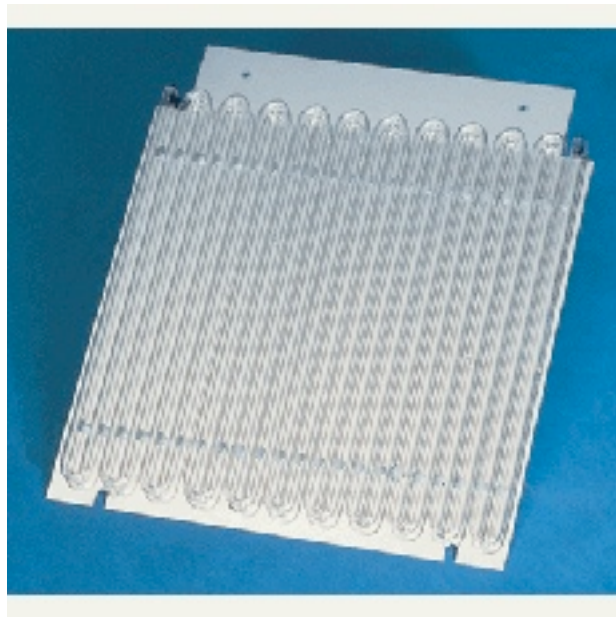
- ▶ Single Tile Processing System will operate at base pressure of $\sim 10^{-9}$ torr
- ▶ Assembled vacuum transfer chambers will be baked at 200–250 °C
 - External heating tapes and Al foil wrap
 - Internal halogen lamp heater assemblies in 3 of the 4 work areas
 - Initial bakeout will be 1–2 months to achieve base pressure
- ▶ Bakeout of single tile assembly parts is done at 350 °C locally using halogen lamp heater assemblies
 - Assume radiant heating, e.g. T3 halogen lamp
 - If necessary, use conduction heating via metal plate heated by T3 halogen lamp



Requirements for Scrubbing

- ▶ Depending on coatings & pre-baking, SSL has seen behavior consistent with no gain drop during for several $\times 0.1 \text{ C/cm}^2$
- ▶ Whether gain changes or not, assume some scrubbing is wanted to pre-condition MCPs, e.g. remove residual trapped gas
 - Any changes in chemistry? SSL behavior seems to imply no.
- ▶ Scrub with UV Pen-Ray lamp?
 - Mercury (primary energy at 254nm)?

Lamps available in variety of shapes for a price



Plans for Baking & Scrubbing

- ▶ Baking -- Internal
 - Halogen lamp heater arrays part of Vacuum Transfer System design
 - Quotes in cost book for heater arrays and controllers
 - Baking stations in
 - Top window load-lock station
 - Photocathode deposition (for alkali metal deposition)
 - Tile Base Scrub Station
- ▶ Baking -- External
 - Initial longterm bake with heater tapes and foil for achieving base pressure target
 - Periodic rebaking as required to maintain base pressure, recover after system modifications, remove accumulated or unexpected contaminants
- ▶ Scrubbing
 - Take advantage of the experience and knowledge of Ossy and Jason at SSL
 - The mechanism of scrubbing needs study (in papers and in the lab) as we put the system together